

The National Geothermal Collaborative
EERE – Geothermal Program
Final Scientific/Technical Report
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I. Executive Summary

The **purpose** of the National Geothermal Collaborative (NGC) is to advance the development and use of geothermal heat and power in the U.S. by identifying issues that impede the use of geothermal power, establishing dialogue with key stakeholders, and catalyzing activities to overcome obstacles to appropriate development. Our **vision** is that geothermal power is environmentally, economically and politically sustainable and fully integrated into mainstream energy markets.

II. Comparison of Actual Accomplishments with the goals and objectives of the project

The NGC identified issues that impede the use of geothermal power through discussions among the steering committee and from the work of the Impediments working group. The identified impediments led the steering committee developing activities, events, and products (generated and distributed) to overcome the impediments (please see the list of activities and products following). Among the many lessons learned through the NGC, it became apparent that even within a representative subset of the larger geothermal community, a great deal of disparity exists around people's understanding of the critical fact patterns. Consequently, more time than was expected was focused on getting to consensus agreement on the products. Much criticism was associated with the consensus building process, and members made it clear post facto that they would prefer for future efforts to be more clearly targeted at problem-solving, as opposed to building agreement. However, it is worth noting that the NGC issue briefs, once in print, have been and continue to be referenced and praised. The consensus building process on the NGC products had a secondary benefit to the geothermal collaborative. As mentioned, the process clarified the disparity of understanding about certain fact patterns and brought all the members of the steering committee into agreement about a single set of assumptions and understandings.

The NGC had two product shortcomings: the consensus document that captured the primary impediments to appropriate geothermal development took the life of the project and was not a published consensus product and the final write up of the land use situation assessment in the Pacific Northwest was not completed, although a presentation was developed and given on the results. Although the Impediments document was not completed until near the end of this project, the group continued to work on many, many iterations over the years and was extremely useful in each iteration. Their work directed the activities of the steering committee throughout the life of the project. As with the issue briefs, which were consensus based documents, the impediments document named the suite of challenges and thought through some possible solutions to those for appropriate geothermal development.

The NGC was able to expand on current work, through adaptive management, and take up the request to assist USFS and BLM develop a national geothermal MOU (as stipulated in the Energy Policy Act of 2005), building on their coordination/cooperation efforts and the work on revising the California MOU for geothermal. While that appeared, from our work plan to be a deviation, this was in fact a longstanding recommendation articulated by the Impediments working group.

III. Activities: Summary of project activities for the entire period (“including original hypotheses, approaches used, problems encountered and departure from planned methodology and assessment of their impact on the project results”)

- 1) **Steering Committee** - included representation from the Western Resource Advocates, White House Task Force on Energy Project Streamlining, Council of Energy Resource Tribes, Geothermal Resources Council, Geothermal Energy Association, Southern California Edison, Seattle City Light, University of Washington, National Conference of State Legislatures, and U.S. Departments of Agriculture (Forest Service), Interior (Bureau of Land Management) and Energy.
 - **Meetings** – The Steering Committee met at least twice a year in person, and several times on conference calls.
- 2) **Issue Briefs** – The steering committee commissioned the National Conference of State Legislatures to draft issue briefs. The steering committee revised the document through a three step consensus process. In January, 2005 the eight Issue Briefs were published and distributed to legislators/legislative staff, legislative libraries, members of energy or natural resource committees and energy offices in 13 western States (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming), utility cooperatives, power associations, and environmental and energy non-profit organizations. Issue Briefs:
 - “Common Question about Geothermal Energy”
 - “Benefits of Geothermal Energy”
 - “Location of Geothermal Resources”
 - “Guidelines for Siting Geothermal Plants and Electricity Transmission Lines”

- “Geothermal Energy & Economic Development”
- “Geothermal Energy: Technology and Costs”
- “Geothermal Policy Options for States”
- “Geothermal Direct Use”

3) Work Group Efforts

A) Renewable Portfolio Standards (started 2002) - This Consensus report came out of the Steering Committee’s focus of geothermal markets. The outcome of this group was a Steering Committee consensus report that was distributed to decision makers and interest groups (September 2003). The scope of work and request for proposals for a report that would address how state renewable portfolio standards work - what works and doesn’t work in existing RPS systems, how RPS ought to work, information from states that have considered and rejected RPS, what principles should guide decision makers considering adoption of a renewable portfolio standard, how geothermal power should fit into a renewable portfolio standard, what the pros and cons of establishing an RPS system are

In September 2003, the NGC published and disseminated the RPS report to legislators/legislative staff, legislative libraries, members of energy or natural resource committees and energy offices in 13 western States (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming), utility cooperatives, power associations, and environmental and energy non-profit organizations. Since then over 450 of the reports have been distributed and the report has been cited in state legislatures considering RPS legislation.

B) Impediments to Geothermal Development (started 2002) - This working group was to produced an internal findings document that describes the landscape of impediments to geothermal resource development on federal lands. While developing the document the working group began to build on data found to develop problem-solving workshops to explore options and develop the best responses for overcoming identified barriers.

This group met many times and developed several draft documents. The steering committee agreed to keep the document for internal use, for directing the activities of the NGC (as it already had been since the group started working on the document). The final internal document was completed in January 2005.

C) Communication/Coordination Working Group (started 2004) - This work group focused on program awareness and agency coordination and communications, and supported BLM and USFS efforts to revise the California MOU for geothermal resource development. Goals included:

- Increase geothermal-specific knowledge (substantive and procedural) inside of and across land management agencies with programmatic

interest in or jurisdiction over geothermal resource development (BLM, USFS, DOE).

- Lay the groundwork for creation of a network of geothermal experts across a number of agencies who can work together to create a more effective, coordinated approach to geothermal project leasing and permitting.
- Facilitate coordinated efforts among federal agencies and interested outside parties to improve geothermal siting and permitting processes to enable appropriate development-where geothermal power is environmentally, economically and politically sustainable.

These goals were achieved through:

- Briefings with key stakeholders in agencies with direct interest in/jurisdiction over geothermal development.
- Interagency work to revise the California MOU
 - Interviews with BLM staff and state directors and FS staff to inform revisions, including: BLM- Richard Grabowski, Sean Hagerty, Bob Henricks, Tom Lonnie, Leroy Mohorich, Rebecca Watson, Kermit Witherbee, Richard Easterbrook, Nancy Ketrenos, Sally Wisely, Mike Poole, and Dale Fortner; FS- Dean Crandle, Janine Clayton and Bob Fujimoto.
 - Meetings with BLM and USFS to revise the MOU
 - October 2004 – revise the MOU
 - January 19 2005 – revise the MOU
- Interagency work to develop a Nation MOU (as required by the Energy Policy Act of 2004)
 - Public Listening Session – November 17, 2005, Reno, Nevada – Designed and Facilitated this public listening session to gather information and suggestions regarding implementation of the geothermal section of the Energy Policy Act 2005
 - Develop/revise/finalize an MOU
 - Briefings to BLM and FS decision makers on the process (October 25, 2005) and on the draft MOU (January 12, 2006)
 - Compiled suggested changes (December 15-18, 2005)
 - Meetings to develop/revise/finalize – in person (October 26, 2005, November 28-30, 2005, January 10-11, 2006) on the phone (December 29, 2005)
 - Final MOU was submitted to Congress – March 2006
- Education and role clarification through panel discussions and workshops and conference attendance
 - April 2004 - Western Governor's Association, North American Energy Summit Exposition – booth exhibit
 - June 2004 – “BLM Fluid Mineral Conference”, Cheyenne, Wyoming – attended and interviewed participants

- February 2005 – Utah State Working Group meeting – presented raw data on Land Use Assessment interviews
- March 2005 – “Geothermal Power Generation Workshop”, Yakima, Washington – presented raw data on Land Use Assessment interviews
- November 5, 2005 – White House Council on Environmental Quality
- Panel Event: November 2004 - NGC “Geothermal leasing Panel”, Sacramento, California – This event provided an opportunity for federal agency representatives and consultant share information about recent successes and ongoing challenges to geothermal leasing and discuss potential solutions to those challenges.

D) Land Use Assessment (started 2004) – The focus was to craft a situation assessment focused on whether or how appropriate geothermal development could move forward in the Northwest to lay the groundwork for creating a series of problem-solving dialogues to address geothermal development in the Northwest.

- Interviews – NGC staff interviewed key stakeholders identified by the steering committee in California, Oregon and Washington, as well as several additionally suggested stakeholders. Interviews were conducted on the phone and a few were conducted in person at the BLM Fluids Minerals Conference in Wyoming, June 2004. Interviewees included: California Energy Commission, Eliane Sison-Lebrilla, Calpine Energy, Charlene Wardlow; Columbia GeoScience, Al Waibel; Sifford Energy, Alex Sifford; Renewable Northwest Project, Rachel Shimshack; Northwest Energy Coalition, Nancy Hirsch; US Forest Service, Bob Fujimoto; Oregon State Geologist, Vicki McConnell; David McClain; Ormat, Dan Schochet; Bonneville Power Administration, John Pease; Oregon Institute of Technology, John Lund; Portland General Electric, Dennis Blithing; Pan African Energy, Chan Swanberg; Davenport Resources, Tony Bingham; US Geological Society-CA, Colin Williams; Washington State University, Gordon Bloomquist; Northwest SEED, Sara Peterson; Pudget, Tom MacClean; Eric Schuster; DOE, Curtis Framel; Stole Rives, Margate Kirkpatrick; US Geothermal Inc, Doug Glaspey; Cal Energy, Jonathan Weisgall; Seattle City Light, Marilyn Semro; and Idaho State working Group, Jerry Galinato.
- February 19, 2005 – Utah State working Group meeting – presented raw findings from the situation assessment interviews

E) Outreach Materials Working Group – Developed a scope of work, request for proposal, and selected a contractor to develop a quantitative/qualitative examination of public comments recorded in federal and state environmental and permitting review documents to analyze what categories of interests and sectors get involved and which issues they raise; and to use this analysis to design a set of recommended principles for developing effective outreach programs.

- “Geothermal Outreach Principles and Comment Analysis Report” – This Consensus report is a compilation and review of 3,787 individual comments on eight proposed geothermal development locations to analyze what categories of interest and sectors get involved in proposed geothermal project and which issues they raise. From the analysis, a set of recommended principles for developing effective outreach programs were designed. In January 2005, this document was published and disseminated to
- March 29, 2005 – Geothermal Power Generation Workshop in Yakima, Washington, presented results from the report

4) Outreach Activities

- *Events Attended* – January 2003 - “Exploring Utah Geothermal Opportunities” - designed and facilitated

IV. Products: *publications (conference papers, public releases, web site, networks or collaborations, technologies/techniques, etc.)*

- Steering Committee Meeting Summaries
- “*Evaluating State Renewable Portfolio Standards: A focus on geothermal energy*” – Published and distributed September 2003. Over 450 have been distributed to date.
- Panel Event Proceedings: November 2004 - NGC “Geothermal leasing Panel”, Sacramento, California – This event provided an opportunity for federal agency representatives and consultant share information about recent successes and ongoing challenges to geothermal leasing and discuss potential solutions to those challenges.
- “NGC Issue Briefs” – Published and distributed January 2005 - Distributed the eight consensus briefs to over 200 legislators/legislative staff, legislative libraries, members of energy or natural resource committees and energy offices in 13 western States (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming), utility cooperatives, power associations, and environmental and energy non-profit organizations.
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 - “*Geothermal Energy: Technology and Costs*”
 - “*Geothermal Policy Options for States*”
 - “*Geothermal Direct Use*”

- “*Geothermal Outreach Principles and Comment Analysis Report*” – Published and distributed January 2005 – distributed the consensus report to over 200 legislators/legislative staff, legislative libraries, members of energy or natural resource committees and energy offices in 13 western States (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming), utility cooperatives, power associations, and environmental and energy non-profit organizations.